Defining and targeting high-risk populations in Buruli ulcer

Authors' reply

We thank Jordi Landier and colleagues for their comments about our recent Article in *The Lancet Global Health*.[1] In their work, Landier and coworkers generalise some of our observations on Buruli ulcer in Benin to those for Cameroon, the country that has the fifth highest prevalence of Buruli ulcer worldwide. Briefly, they make use of age and sex distribution from the Cameroon national census to show that patients aged 5–14 years were twice as likely to be affected by Buruli ulcer as older individuals; and that boys were over-represented in individuals younger than 15 years, women were over-represented in patients aged 15–50 years, and that men and women were equally represented in patients older than 50 years. They advocate the use of national census references to produce incidence rates and incidence rate ratios (IRRs), which they believe to be the proper way to draw valid conclusions.

We agree that this method is an appropriate way to assess whether Buruli ulcer is over-represented in children, but this issue was not central to our study. We also felt that the introduction of external data, the quality of which we cannot assess and which might not be relevant to areas where Buruli ulcer is endemic—ie, remote rural areas of tropical countries—could lead to bias. Nevertheless, our Article reports that the median age of the population in Benin in 2010 is significantly higher than the median age of our cohort,[1] leading to the same conclusion as the IRRs. Landier and colleagues also define elderly people as a high incidence group. We would be cautious about this conclusion because their report and others do not provide the number of patients in each age group to assess the uncertainty of their measure.[2] As an example, consideration of the low number of patients older than 60 years in our study (one of the largest worldwide) enticed us not to draw conclusions in that age category. With respect to the variation of the sex ratio with age, we are mindful that the national census correction is correct but negligible, because the general population sex ratio does not differ from 1 in Benin, whatever the age group considered.[3] Therefore, Landier and colleagues reach the same overall conclusions as us, an extremely valuable confirmation.

Landier and colleagues note, as we did, that unbalanced age-gender distribution among patients with Buruli ulcer had previously been reported. However, the reference they quote is misleading, because it does not identify differential incidence by sex before the age of 60 years.[2] The research group stated in a later 2009 review that "there are no sex differences in disease instance among children and adults",[4] as did another independent review cited by Landier and colleagues.[5] This is regrettable because this important issue of the variation of the sex ratio with age, although repeatedly reported in research articles on Buruli ulcer, has been disregarded or even denied by most authors of review papers[4,5] (see discussion in our Article[1] for details). This denial has far too long hampered the research on the causes of this age-dependent variation of the sex-ratio in Buruli ulcer, understanding of which will be of great physiopathological, clinical, and, as pointed out by Landier and colleagues, public health relevance.

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*Quentin B Vincent, Marie-Françoise Ardant, Laurent Marsollier, Annick Chauty, *Alexandre Alcaïs, for the Franco-Beninese Buruli Research Group (members listed in appendix)*
alexandre.alcais@inserm.fr

Laboratory of Human Genetics of Infectious Diseases, Necker Branch, Institut National de la Recherche Médicale U1163, Paris, France (QBV, AA); Institut Imagine, Université Paris Descartes, Sorbonne Paris Cité, Paris, France (QBV, AA); Centre de Dépistage et de Traitement de l'Ulcère de Buruli, Pobè, Benin (M-FA, AC); Fondation Raoul Follereau, Paris, France (M-FA, AC); Institut National de la Recherche Médicale U892 et CNRS U6299, Université et CHU d'Angers, Angers, France (LM); St Giles Laboratory of Human Genetics of Infectious Diseases, Rockefeller Branch, Rockefeller University, New York, NY, USA (AA), and Unité de Recherche Clinique, Paris Centre Descartes Necker Cochin, Assistance Publique-Hôpitaux de Paris, Paris, France (AA)

See Online for appendix

1 Vincent QB, Ardant MF, Adeye A, et al. Clinical epidemiology of laboratory-confirmed Buruli ulcer in Benin: a cohort study. *Lancet Glob Health* 2014; **2:** e422–30.
2 Debacker M, Aguiar J, Steunou C, et al. *Mycobacterium ulcerans* disease: role of age and gender in incidence and morbidity. *Trop Med Int Health* 2004; **9:** 1297–304.
3 UN Department of Economic and Social Affairs, Population division. World population prospects: The 2012 revision; highlights and advance tables.2013. http://esa.un.org/unpd/wpp/index.htm (accessed Sept 30, 2014).
4 Portaels F, Silva MT, Meyers WM. Buruli ulcer. *Clin Dermatol* 2009; **27:** 291–305.
5 Jacobsen KH, Padgett JJ. Risk factors for *Mycobacterium ulcerans* infection. *Int J Infect Dis* 2010; **14:** e677–81.